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IS 10818 (1984): Chromite for metallurgical industry [MTD
13: Ores and Raw Materials]



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IS : 10818 - 1984

Indian Standard

SPECIFICATION FOR
CHROMITE FOR METALLURGICAL INDUSTRY

UDC 622.346.1 : 669.263.1



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR CHROMITE FOR METALLURGICAL INDUSTRY

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Indian Standard

SPECIFICATION FOR CHROMITE FOR METALLURGICAL INDUSTRY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 15 February 1984, after the draft finalized by the Ores and Raw Materials Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Chromite finds the single largest use in metallurgical industry for the production of variety of chrome based alloys. With the sophistication in technology, it has been possible to make these alloys by a variety of intermediate additives. A need has thus arisen to classify the quality of raw ore to produce these intermediates, such as different grades of ferro-chrome, and silico-chrome. Besides, recently it has also been possible to make use of lower grade ore in the production of such alloys as charge-chrome. In view of this it became necessary to lay down specifications of chrome ore required for the production of different grades of commercially available ferro-chrome, silico-chrome and charge-chrome. It is hoped that such an attempt would not only help the industry in obtaining most appropriate raw material but also widen the resource base of chromite for metallurgical industry in general.

0.3 No marking clause has been included in this standard as chromite is supplied loose.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements for four grades of chromite (chrome ore) for metallurgical industry.

*Rules for rounding off numerical values (*revised*).

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of chromite ore shall be laid down as in IS : 1387 - 1967*.

3. GRADE DESIGNATION

3.1 For the purpose of this standard chromite for metallurgical industry has been classified into four grades depending on the end use, namely:

- a) Low carbon ferro-chrome grade,
- b) High carbon ferro-chrome grade,
- c) Silico-chrome grade, and
- d) Charge-chrome grade.

4. CHEMICAL REQUIREMENT

4.1 All the four grades of chromite, when analyzed either in accordance with IS : 4737-1982† or by any other established instrumental/chemical method shall have the chemical composition as given in Table 1. In case of dispute the procedure in IS : 4737-1982† shall be the referee method. In case if the particular method is not given in IS:4737-1982†, the method mutually agreed to shall be the referee method.

TABLE 1 CHEMICAL COMPOSITION OF CHROMITE FOR METALLURGICAL INDUSTRY

Sl. No.	CHARACTERISTIC (ON DRY BASIS)	GRADE			
		LOW CARBON FERRO-CHROME	HIGH CARBON FERRO-CHROME	SILICO-CHROME	CHARGE-CHROME
(1)	(2)	(3)	(4)	(5)	(6)
i)	Cr ₂ O ₃ percent, <i>Min</i>	48	48	48	44
ii)	Total iron percent, <i>Max</i> (as FeO)	15	16	15	18
iii)	Al ₂ O ₃ percent, <i>Max</i>	13	13	13	10
iv)	SiO ₂ percent, <i>Max</i>	5	8	10	12
v)	CaO percent, <i>Max</i>	5	5	5	5
vi)	MgO percent, <i>Max</i>	14	16	14	12
vii)	Sulphur* (as SO ₃) percent, <i>Min</i>	0.1	0.1	0.1	0.14
viii)	Phosphorus* (as P ₂ O ₅) percent, <i>Max</i>	0.005	0.02	0.02	0.2
ix)	Cr : Fe, <i>Min</i>	3 : 1	2.8 : 1	3 : 1	1.6 : 1
x)	MgO : Al ₂ O ₃ (range)	—	1.2 to 1.4	—	—

*Sulphur (as SO₃) and phosphorus (as P₂O₅) may be determined as agreed upon by the supplier and the purchaser.

*General requirements for the supply of metallurgical materials (*first revision*).

†Chromite for chemical industries (*first revision*).

5. PHYSICAL REQUIREMENTS

5.1 All the four grades of chromite shall have the physical requirements as given in Table 2.

TABLE 2 PHYSICAL REQUIREMENTS OF CHROMITE FOR METALLURGICAL INDUSTRY

SL. No.	CHARACTERISTIC	REQUIREMENT			
		Low Carbon Ferro-Chrome Grade	High Carbon Ferro-Chrome Grade	Silico-Chrome Grade	Charge-Chrome Grade
(1)	(2)	(3)	(4)	(5)	(6)
i)	Nature	Fine	Hard lumpy	Fine/Hard lumpy	Hard lumpy or agglomeration fine
ii)	Bulk density, g/cc	2.1 - 2.25	1.85 - 2.2	2.1 - 2.25/1.8 - 2.2	1.75 - 2.0
iii)	Size, mm	+2 -12	+12 -100	+2 / +12 -12 / -100	+12 -100

6. SAMPLING

6.1 Representative samples of chromite for testing shall be drawn according to the scheme of sampling given in IS : 8562 - 1977*.

*Methods of sampling chrome ore.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	$1 \text{ N} = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volt	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/m}^2$